

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2004/001870

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7: A61K 48/00; A61K 47/44; A61K 9/06; A61K 38/21; A61P 17/00; A61K 31/7088

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
A61K 48/00; A61K 47/44; A61K 9/06; A61K 38/21; A61P 17/00; A61K 31/7088

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Canadian Patent Database, Delphion, Pubmed, USPTO, STN

Search terms: cationic, gemini, dimeric, surfactant, detergent, *bis*-surfactant, DNA, gene, nucleic acid, transfection, gene therapy, DNA vaccine

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No(s). |
|-----------|--|--------------------------|
| Y | McGREGOR C ET AL 4 Jul 2001 Rational approaches to the design of cationic gemini surfactants for gene delivery. J AM CHEM SOC 123(26):6215-6220 Whole document | 1-100 |
| Y | RON SIN G ET AL 7 Nov 2001 Novel spermine-based cationic gemini surfactants for gene delivery. CHEM COMMUN (CAMB) 7(21):2234-2235 Whole document | 1-100 |

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"I" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search
31 January 2005 (31-01-2005)

Date of mailing of the international search report
02 March 2005 (02-03-2005)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No(s). |
|-----------|--|---------------------------------------|
| Y | WO9929712 SMITHKLINE BEECHAM PLC (Camilleri P et al) 17 Jun 1999 Examples 17-19 | 1-100 |
| Y | VOGEL JC 1 Nov 2000 Nonviral skin gene therapy. HUMAN GENE THERAPY 11:2253-2259 Whole document | 1-100 |
| Y | SAPADIN AN & FLEISCHMAIER R Jan 2002 Treatment of scleroderma. ARCH DERMATOL 138(1):99-105 Whole document | 1-100 |
| Y | CHOI MJ & MAIBACH HI Sep-Oct 2003 Topical vaccination of DNA antigens: topical delivery of DNA antigens. SKIN PHARMACOL APPL SKIN PHYSIOL 16(5):271-282 Whole document | 12-20, 32-46, 52-60, 72-80, 92-100 |

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

7. Claim Nos. : 41-100
because they relate to subject matter not required to be searched by this Authority, namely :
Remark: Although claims 41-100 are directed to use of the delivery system and methods thereof for treatment of skin disorders and metabolic diseases in an human or animal subject which this Authority is not obliged to search under Rule 39.1(iv) of the PCT, the search has been carried out based on the alleged effects and use of the delivery system.

8. Claim Nos. :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :

9. Claims Nos. :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

10. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

11. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

12. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos. :

13. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos. :

Remark on Protest

The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2004/001870

| Patent Document Cited in Search Report | Publication Date | Patent Family Member(s) | Publication Date |
|---|---------------------|---|--|
| WO9929712 | 17-06-1999 | CA2312941 A1 EP1037903 A1 GB9726073D D0 JP2001525419T T US6693167 B1 US2004043939 A1 WO9929712 A1 | 17-06-1999 27-09-2000 04-02-1998 11-12-2001 17-02-2004 04-03-2004 17-06-1999 |